

## **CAMP POST-FIRE WERT ASSESSMENT EXECUTIVE SUMMARY**

### **CA-BTU-016737 - WERT Evaluation**

The Camp Fire started on November 8, 2018 on Pulga Road and Camp Creek Road near Jarbo Gap and has burned a total of 153,336 acres (about 240 square miles). A total of 13,983 single, multiple, and mixed commercial residences, 528 commercial and 4,293 other buildings were destroyed. To date, 85 civilian fatalities have been recorded. As a result, the Camp Fire has been designated the most destructive and deadliest California wildfire to date. Acting Governor Newsom issued a State of Emergency Proclamation for Butte County on November 8. A Presidential Major Disaster Declaration followed on November 12, and included the fires burning in Los Angeles and Ventura Counties. Local and state responsibility areas accounted for approximately 85 percent of the burn area, with the remaining 15 percent under federal responsibility area.

Due to the large proportion of private land impacted by the Camp Fire, the burned area was evaluated by an interagency Watershed Emergency Response Team (WERT) comprised of engineering geologists, hydrologists, foresters, engineers and GIS specialists. The WERT rapidly evaluated post-fire watershed conditions, identified potential values-at-risk related to human life-safety and property, and evaluated the potential for increased post-fire flooding and debris flows. The team also recommended potential emergency protection measures to help reduce the risks to those values.

### **Summary of the WERT Key Findings**

- Approximately 82 percent of the fire is low/unburned soil burn severity, 16 percent of the fire is moderate soil burn severity, and 2 percent of the fire is high soil burn severity.
- 1,416 watershed basins were evaluated for post-fire debris flow hazards. Using a design storm with a peak 15-minute intensity of 0.4 inches (40 mm/hr), 420 of the 1,416 basins (approximately 30 percent) have a likelihood of 60 percent or greater probability of debris flows. The majority of these basins are located along steep slopes that flank the North Fork Feather River and the West Branch of the Feather River upstream of Lake Oroville.
- Twelve sub-watersheds (i.e., pour points) were specifically analyzed for increased post-fire sediment-laden flood hazards, including sub-watersheds identified as having resources at risk within identified FEMA 100-year flood zones, DWR awareness floodplains, and USGS designated Watch Streams.

Post-fire peak flows for return periods  $\leq 10$  years were estimated to increase between 10% and 70% over pre-fire flows, with the highest increases occurring at the inlet to the Concow Reservoir.

- ERMiT post-fire erosion model predictions suggest an area averaged sediment production rate for a 2-year recurrence storm event to be approximately 6 tons per acre, or approximately 4 times more sediment production relative to unburned sites.

### **Identified Values-at-Risk and Hazards, and Emergency Conditions**

The WERT's objectives for the burned area were to quickly identify potential post-fire life-safety threats, including those from debris flows, flooding, rock fall, and erosion. The WERT identified values-at-risk (VARs) resulting from increased post-fire debris flow hazard, rock fall hazards, flood flows, and increased erosion and sediment delivery. A total of 58 VARs were identified, including 36 VAR points, generally associated with individual structures and/or drainage structures, and 22 VAR polygons, generally associated with road segments and flood prone areas. One (1) VAR was classified as having a high hazard to life and safety. Five (5) point VARs and two (2) polygon VARs are classified as having moderate hazard to life and safety. The remaining VARs are classified as having a relatively low hazard to life and safety, but this does not equate to an absence of risk. Furthermore, some VARs were identified in association with burned residences, with the assumption that temporary housing might be placed onsite during the rebuilding phase.

Key areas of concern are:

- Flooding and debris flow impacts to structures in the town of Pulga.
- Flooding and debris flow impacts to segments of State Highway 70 and Union Pacific Railroad within the Feather River Canyon and local access roads, such as Honey Run Road and Jordan Hill Road with moderate to high risk of debris flow.
- Flooding and debris jams within designated FEMA 100-year flood zones, DWR awareness floodplains, and/or USGS modelled Watch Streams in Butte Valley and Butte Creek Canyon east of Chico.
- Rock fall hazards downslope of steep rocky slopes, particularly along the Highway 70 and Union Pacific Railroad corridors.
- Impacts to water quality within local reservoirs (e.g. Lake Oroville) used for municipal drinking water supply.
- Debris flow and flood impacts to drainage diversion structures located on Little Butte Creek and Little Chico Creek.

### **General Recommendations**

General recommendations to mitigate fire-related impacts to identified VARs include:

- Increasing affected resident and the community situational awareness about the hazards and risks associated with living downstream/downslope of a burned area.
- Utilizing early warning systems available to homeowners, particularly those located in debris flow and flood prone areas.
- Performing storm patrols and monitoring road drainage infrastructure, particularly along State Highway 70.
- Properly locating temporary housing when rebuilding.
- Placing temporary signage in areas of potential post-fire rockfall, debris flow, and flooding hazards.
- Monitoring and/or removing accumulated debris from within channels that are subject to post-fire flooding, where there is an elevated risk to life and property.
- The burned debris from structures and vehicles should either be properly disposed of, or mitigations put in place to prevent runoff from burned sites from entering watercourses. Areas with the highest density of burned structures near watercourses or with storm drainage systems that drain directly to watercourses should be the priority.

**It should be noted that the findings included in this report are not intended to be fully comprehensive or conclusive, but rather to serve as a preliminary tool to assist Butte County Office of Emergency Services, local first responders, Butte County Department of Public Works, City of Chico, City of Paradise, City of Oroville, Caltrans, the California Governor's Office of Emergency Services, the United States Department of Agriculture Natural Resource Conservation Service, utility companies, and other responsible agencies in the development of more detailed post-fire emergency response plans. It is intended that the agencies identified above will use the information presented in this report as a preliminary guide to complete their own more detailed evaluations, and develop detailed emergency response plans and mitigations.**